



# Should securities regulation promote equity crowdfunding?

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**Abstract** In this paper, we show that too strong investor protection may harm small firms and entrepreneurial initiatives, which contrasts with the traditional “law and finance” view that stronger investor protection is better. This situation is particularly relevant in equity crowdfunding, which refers to a recent financial innovation originating on the Internet that targets small and innovative firms. In many jurisdictions, securities regulation offers exemptions to prospectus and registration requirements. We provide an into-depth discussion of recent regulatory reforms in different countries and discuss how they may impact equity crowdfunding. Building on a theoretical framework, we show that optimal regulation depends on the availability of an alternative early-stage financing such as venture capital and angel finance. Finally, we offer exploratory evidence from Germany on the impact of securities regulation on small business finance.

**Keywords** Equity crowdfunding · Crowdfunding · Small business finance · Securities regulation · Investor protection

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## 1 Introduction

“We need to have some experience with [equity crowdfunding] before we take away the safety net ... This is a new and dramatically different procedure with a high potential for fraud.”<sup>1</sup>

John Coffee Jr. (Columbia University)

Securities regulation is a driving policy tool for ensuring strong investor protection and, thus, stock market development (La Porta et al. 1997, 1998; La Porta et al. 2006). Traditionally, stronger securities regulations emerged in response to the financial crises, accounting scandals, corporate governance problems, and financial innovations. For example, the United States (US) Congress adopted the Securities Act of 1933 and the Exchange Act of 1934 in response to the stock market crash of 1929 and the resulting Great Depression. These regulations were intended to mitigate the information asymmetries between securities issuers and investors, complementing former state-level legislation in place at the time. Similar actions were taken in other developed countries, most recently as a response to the financial crisis of 2008.

Securities regulation primarily concerns firms, which seek to place large security issues to the general public. Fervent debate about reforming securities regulation has arisen from the emergence of equity crowdfunding (also referred to as investment-based crowdfunding,

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<sup>1</sup> Source: Wall Street Journal, 1 May 2014.

securities crowdfunding, or crowdfinancing), which describes a financial innovation in securities issuance that gives small entrepreneurs access to the general public (Ahlers et al. 2015; Hornuf and Schwienbacher 2016; Vismara 2016a, Vismara 2016b). While transaction costs made it unlikely in the past that small amounts would be offered to the general public, the Internet now provides opportunities to do so. Equity crowdfunding has therefore become a viable alternative form of external finance for entrepreneurial firms in countries that permit the solicitation of the general public without the issuance of a costly prospectus. In this paper, we investigate the impact of securities regulation on equity crowdfunding and whether securities regulation should promote equity crowdfunding in order to offer alternative source of finance to entrepreneurial firms.

Traditional research on securities regulation, such as that by La Porta et al. (1997, 1998), who focus on the impact of legal rules on stock markets and economic growth, considers measures of investor protection that mostly apply to large and publicly traded corporations. Our approach here is different, because we concentrate on smaller firms, which are most likely to benefit from available exemptions. Regarding the exemptions in securities law, countries differ along the minimum issuance size that requires compliance with prospectus and registration requirements that define responsibilities and liabilities of management concerning information disclosure. Such differences enable us to explore the impact of exemptions and, thus, investor protection for small issuances on equity crowdfunding. Therefore, our approach takes the perspective proposed by Acs et al. (2016) in that, it examines the impact of country-specific institutional arrangements on the pursuit of micro-level opportunities to create and fund new ventures.

This paper aims to understand how securities regulation affects equity crowdfunding, in particular, the exemptions to prospectus and registration requirements. In a first step, we therefore provide an overview of the legal regime as well as regulatory reforms that have recently taken place in different jurisdictions (Section 2). In a second step, we present a theoretical framework based on small firms deciding between raising their funds from professional investors (venture capital funds, business angels) and launching an equity crowdfunding campaign (Sections 3 and 4). Finally, although data collection is limited because markets are still nascent, we offer the first evidence on how the equity

crowdfunding market is emerging and affected by the regulation in place (Section 5). Consistent with our predictions, our empirical analysis indicates that firms raise inefficiently low amounts of money when the exemptions are restrictive. The German case best evidences these funding constraints. Finally, we discuss how the existing rules have performed so far and conclude (Section 6).

## 2 Recent reforms promoting equity crowdfunding

In Europe, equity crowdfunding has challenged securities regulation because it makes use of the exemptions, as defined in the national regulation of prospectus and registration requirements. This enables firms to raise external finance while avoiding incurring significant compliance costs.<sup>2</sup> In many countries, the capital raised in equity crowdfunding campaigns falls under exemptions, most importantly with regard to the total amount of the offer. Other exemptions refer to the maximum number of investors to whom the offer is made, the minimum contribution imposed on investors, the minimum denomination of the securities offered, and whether the offer is made to qualified investors only.

Recently, regulators around the world have realized the economic potential of equity crowdfunding and started easing the national securities regulation for crowdfunding activities that take place in the Internet. At least seven jurisdictions have reformed their securities regulation to suit the needs of equity crowdfunding more effectively, while also protecting investors from fraud up to a certain level and reducing legal uncertainty for issuing firms. In what follows, we investigate how legislators have tried to unwind the inefficiency at the firm level that will be the basis of our theoretical model. The main reforms are summarized in Table 1.

<sup>2</sup> The initial compliance costs of a typical IPO often exceed \$1,000,000 because issuers must conduct a due diligence, hire a legal counsel and underwriter, pay SEC filing fees, state securities filing fees, stock exchange or OTC registration fees, accounting fees and an increased D&O insurance premium (Bagley and Dauchy 2003). For equity crowdfunding, costs are lower because smaller and simpler firms that do not seek a public listing make offers. Still, according to Darren Westlake, founder of the UK portal *Crowdcube*, costs for such prospectus approvals are in the range between £20,000 and £100,000 in the UK.

**Table 1** Overview of Reforms

	Reform	Maximum issue w/o prospectus	Maximum amount sold to investor	Regulation of gatekeeper	Disclosure requirements	Investor education
Austria	Alternativfinanzierungsgesetz (AltFG) 2015, previous reform of the Kapitalmarktgesetz in 2013	EUR 5,000,000 (previously €250,000, before that EUR 100,000)	Single issuer limits 10% of net investable financial assets or twice the monthly net income; max. EUR 5000 in case the investor has a net income of EUR 2500 or less	Trade authority or security regulator can authorize platform	Minimum information disclosure regarding the issuer and financial instrument for issues larger than EUR 250,000 (stocks and bonds) and EUR 1,500, 000 (other investments) information disclosure requirements (e.g., annual statements) required for issues up to EUR 5,000,000 simplified prospectus	
Belgium	Loi du 25 avril 2014 portant des dispositions diverses, published at the official journal Moniteur Belge on 7 May 2014 nr. 36946	EUR 300,000 if no investor can invest more than EUR 1000; otherwise, EUR 1,000,000	Single issuer limit EUR 1000 for issues between EUR 100,000 and EUR 300,000; no single issuer limit for issues below EUR 100,000			
France	Ordonnance nr. 2014–559 of 30 May 2014; Decret d'Application nr. 2014–1053 of 16 September 2014	EUR 2,500,000 (previously EUR 100,000)	Single issuer limit EUR 1000 of investor does not want to provide personal information); otherwise, twice the monthly net income; max. EUR 10,000	Securities regulator authorizes platform	Obligation of the issuers to supply simplified documentation to the investors, but not subject to approval by the securities regulator	Investors must undergo a test that determines their risk profile, the results of which must be in line with the risks involved in equity crowdfunding
Germany	Kleinanlegerschutzgesetz 2015	EUR 2,500,000 (previously EUR 100,000)	Single issuer limit EUR 1000 of investor does not want to provide personal information); otherwise, twice the monthly net income; max. EUR 10,000	Trade authority authorizes platform	Small information leaflet	
Italy	Decreto Legge n. 179/2012 and Decreto Legge n. 33/2015	EUR 5,000,000 (previously EUR 100,000)*	Aggregate limit of 10% of net investable financial assets	Securities regulator authorizes platform		Retail clients need to seek financial advice
UK	PS14/4 2014	EUR 5,000,000 (previously EUR 5,000,000)	Aggregate limit of USD 2000 to USD 100,000 annually	Securities regulator authorizes platform	If the overall amount of the issue is \$100,000 or less, issuers must provide the most recent income tax	Funding portal or broker-dealer needs to provide dis-closures, including
USA	JOBS act (Title III) 2012	USD 1,000,000 (previously USD 0)				

**Table 1** (continued)

Reform	Maximum issue w/o prospectus	Maximum amount sold to investor	Regulation of gatekeeper	Disclosure requirements	Investor education
		depending on the income and net wealth	funding portal or broker-dealer	returns and financial statements, which must be certified by the principal executive officer. For issues of more than \$100,000 but less than \$500,000, financial state must be provided and reviewed by a public accountant, who should be independent from the issuer. The accountant must use professional standards and procedures for the review. For issues of more than \$500,000, the issuer must provide audited financial statements.	disclosures related to risks and other investor education materials.

\*Only “innovative startups” and “innovative SME’s” eligible: [a] the incorporation and business operations of the firm should have taken effect no more than 48 months ago; [b] the management is located in Italy, and the main business activities take place there; [c] the annual turnover in the second year of business as stated in the last accounts does not exceed €5,000,000; business activities of the firm take place in Italy; [d] the firm does not and did not make payouts to shareholders using previous corporate profits; [e] the sole or main purpose of the firm is to develop, produce, and sell innovative products or services with a high-technological value; [f] the firm was not established as part of a merger, de-merger, or sale of a corporation or corporate entity; and; [g] the firm fulfills at least one of the following conditions: (1) the firm invests at least 15% of the greater of the annual production costs or the production value in R&D; (2) one-third of the employees, who have obtained a PhD, are enrolled in a university PhD program or two-thirds of the employees have obtained an academic degree or have worked for more than 3 years in a private or public research institution; or (3) the firm owns a patent on an industrial, biotech or electronic semiconductor innovation or owns the right on a software, which is registered in the public software register, related to the purpose of the corporation. Article [a] does not apply to “innovative SME’s”. However, they need to provide an audited balance sheet to investors.

## 2.1 USA

As a principal rule of the US securities law, securities that are offered to the general public must be registered with the SEC. This is to protect investors from securities fraud by holding the issuer and underwriter of the security liable in case of material misstatements or omissions of material facts. However, to account for the needs of small offerings, exemptions to this rule exist. For example, accredited investors who can fend for themselves or public offers up to \$5,000,000 have been exempted from registration with the SEC. However, while the former exemption does per definition not apply to the larger crowd, the latter exemption was of no use for equity crowdfunding because the registration at the state level was still required, making a geographically dispersed offer prohibitively expensive.

It was mainly for this reason that the US Congress passed detailed rules specifically tailored to equity crowdfunding. On April 5, 2012, the JOBS Act was signed into law, amending the existing exemptions for raising capital under Section 4(6) of the Securities Act. According to Title III of the JOBS Act (also referred to as CROWDFUND Act), issuers can now raise an overall amount of up to \$1,000,000 during a 12-month period without filing a registration statement with the SEC or at the state level. The legislator tied this exemption, however, to three conditions: the usage of a broker-dealer or funding portal, limitations on the amount that can be sold to individual investors, and disclosure requirements for the issuers.

According to Section 4(6)(C) of the Securities Act, issuers can now offer or sell securities without a registration statement if the transactions is conducted through a broker-dealer or funding portal as defined in Section 3(a)(4) and Section 3(a)(80) of the Securities Exchange Act. In this way, the JOBS Act de facto established a private gatekeeper for equity crowdfunding issues, which is supposed to ensure the correctness and completeness of the securities offered. However, the JOBS Act did not make explicit that funding portals would be liable for material misstatements or the omission of material facts by the issuer. While the JOBS Act explicitly states that equity crowdfunding issuers will be liable for such offenses, it could be argued that the liability of the funding portal can be derived from Rule 10b-5 of the Code of Federal Regulations (CFR) as well as the previous Supreme Court decisions (Knight et al. 2012).

In addition, the US legislator strives to protect investors through limiting the amount that an investor may invest in the entire market (*aggregate limit*). According to the JOBS Act, this aggregate limit shall not exceed the greater of either \$2000 or 5% of the annual income or net worth of an investor if either the annual income or the net worth of the investor is less than \$100,000. If the annual income or the net worth of the investor is equal to or exceeds \$100,000, the aggregate limit sold to the investor shall not exceed 10% of either its annual income or net worth, with the respectively greater value applying. In any case, the maximum aggregate limit sold to a single investor shall not exceed \$100,000.

Finally, Section 4A(b) of the Securities Act defines the type of information that must be disclosed to potential investors. If the overall amount of the securities issue is equal to or below \$100,000, issuers must provide their most recent income tax returns and financial statements, which must be certified by the principal executive officer of the issuer. For issues of more than \$100,000 but less than \$500,000, financial statements must be provided and reviewed by a public accountant, who should be independent from the issuer. Furthermore, the accountant must use professional standards and procedures for the review. For issues of more than \$500,000, the issuer must provide audited financial statements.

In summary, the US equity crowdfunding legislation has not only established a maximum value for offers without a prospectus but also set thresholds for the amounts an individual can invest. By considering the compliance costs associated with the provision of information, the JOBS Act further outlined a three-step approach on information disclosure. These regulatory measures were combined with the establishment of a private gatekeeper.

## 2.2 Selected reforms in the European Union

The prospectus regulation in the EU has been harmonized for offers larger than €5,000,000 through directives that were enacted through national implementation laws by the respective EU member states. Therefore, it is useful to first present EU-level regulation for prospectus regulation before discussing the recent reforms undertaken by individual jurisdictions.

A main attempt to harmonize regulation on registration statements was made with the Directive 2003/71/EC of 4 November 2003, which specifies when and how a prospectus must be published if securities are offered

to the general public. More recently, it was amended by the Directive 2010/73/EU of 24 November 2010, which, among other things, modified the extent of certain exemptions. Exemptions to publishing a prospectus apply if at least one of the following criteria is met:

- [a] The offer is addressed solely to qualified investors;
- [b] The offer is addressed to fewer than 150 natural or legal persons per member state, other than qualified investors;
- [c] Investors purchase securities for a total consideration of at least €100,000 per investor;
- [d] The denomination per unit amounts to at least €100,000; and
- [e] The offer of securities represents a total consideration of less than €100,000 over a 12-month period.

In addition to these exemptions, Directive 2010/73/EU allows national regulators of the EU member states to increase the amount in point [e] up to €5,000,000.

### 2.2.1 Italy

The Italian legislator amended the existing securities law (TUF, *Testo Unico della Finanza*) and adopted the first specific equity crowdfunding legislation in Europe. On October 20, 2012, the Decreto Legge n. 179/2012 went into effect. Exemptions now apply to innovative startups and after the implementation of Decreto Legge n. 33/2015 in 2015 also to innovative small and medium-sized enterprises (SMEs) that offer common equity shares via online portals. Innovative startups and SMEs complying with the law can now make offerings of up to €5,000,000 without the obligation to register a prospectus. The legal definition of an innovative startup and SMEs is geared to firms, which are not registered with a regulated market or a multilateral trading facility and fulfill a lengthy catalog of criteria (see Table 1 for further details). Although the Italian securities regulator Consob was required to set up a public register and define disclosure requirements for innovative startup and SME issuers, it did not have to define which exemptions and critical threshold for issues without a prospectus would apply for *non-innovative* startups and SMEs. In summary, the Italian equity crowdfunding regulation established

a very narrow exemption, which might lead to a considerable amount of legal uncertainty.

### 2.2.2 Austria

In July 2013, the Austrian legislator changed the national securities law (KMG, *Kapitalmarktgesetz*) and raised the critical threshold for issues without a prospectus from €100,000 to €250,000. In October 2013, the first equity crowdfunding was then offered to investors by the portal 1000×1000, with the first issuer Woodero raising a total of €166,950 after a nearly eight-week funding period. The amount clearly exceeded the initial value of the critical threshold for issues without a prospectus, indicating that issuers would have been constrained under the earlier regulation. In 2015, Austria adopted a new regulation (*Alternativfinanzierungsgesetz*; see Schwienbacher 2016, for a discussion) and allows issues up to €5,000,000 requesting only a very simplified prospectus from the issuer (see the *Alternativfinanzierungs-Informationsverordnung*).

### 2.2.3 UK

In the UK, equity crowdfunding currently takes place under the general securities regulation, more precisely the Financial Services and Markets Act 2000. In October 2013, the Financial Conduct Authority (FCA) initiated a consultation on a specific equity crowdfunding regulation. The new rules were enacted in April 2014 and aim to make equity crowdfunding “more accessible to a wider, but restricted, audience” of investors, while also ensuring that “only those retail investors who can understand and bear the various risks involved are invited to invest in unlisted shares or debt securities”. The FCA only allows the brokering of securities to sophisticated investors, high net worth investors, corporate finance contacts, or venture capital contacts, retail clients who confirm that they will receive regulated investment advice or investment management services from an authorized person, or retail clients who certify that they will not invest more than 10% of their net investible assets in unlisted shares or unlisted debt securities.

### 2.2.4 France

As a member state of the EU, France implemented the Prospectus Directive 2010/73/EU and thus applies the same rules as other EU jurisdictions, with some



adaptations. The exemption for security offers with a total amount of less than €100,000 holds. However, for the range between €100,000 and €1,000,000, an additional exemption applies if the total amount raised does not exceed 50% of the existing equity capital of the firm. For example, a firm can raise €200,000 without a prospectus and registration if it already possesses equity capital of at least €400,000. This is unlikely to occur for firms relying on equity crowdfunding, because they generally have little capital on the balance sheet before a successful campaign. The French portal Anaxago does not use the €100,000 limit to exempt firms from the prospectus regulation but rather limits the offer to fewer than 150 non-accredited investors. Consequently, investors are required to participate with high minimum tickets, as only a subset of the solicited people may eventually invest. The advantage is that the total amount of the equity issuance is not limited to €100,000. For the offerings successfully completed so far, the average number of crowdfunders on Anaxago is 25, with an average amount raised of more than €320,000.

Importantly, French portals need to obtain a license from the French securities regulator AMF because they act as financial intermediaries and thus are subject to their own rules. The former legal status and requirements in terms of capital imposed on financial intermediaries made it costly for portals to comply. On February 14, 2014, the ministry of economic affairs and finance announced measures to facilitate equity crowdfunding that have become effective in autumn 2014. Among other things, the new regulation contains the following items:

- [a] The creation of a special legal entity for accredited equity crowdfunding portals, which differs from the one that other financial intermediaries use (so-called *Conseiller en Investissement Participatif*). No minimum equity capital is required for this legal entity. However, it must comply with transparency rules that ensure that the crowd obtains “fair” and “unbiased” information on the offers.
- [b] Investors must undergo a test that determines their risk profile, the results of which must be in line with the risks involved in equity crowdfunding. Crowdfunders must also be made aware when registering at the portal of the risks involved in equity crowdfunding.
- [c] The threshold of exemption is increased to €1,000,000, provided the equity crowdfunding

campaign takes place on an Internet portal that has received formal approval from the AMF.

- [d] Obligation of the issuers to supply simplified documentation to the investors, as described in the reform (but not subject to approval by the AMF).

### 2.2.5 Belgium

In 2014, Belgium introduced a reform as a way to foster equity crowdfunding while at the same time acting cautiously to avoid a bubble. The new regulation allows issuances up to €300,000 provided no investor is allowed to invest more than €1000 per campaign. Unlike in the USA, the Belgian regulator has defined the amount that an investor may invest in the same issuer (*single issuer limit*) not the overall market. The law requires that issuers explicitly state this single issuer limit in the offer. If the single issuer limit is not imposed, issuers remain limited at raising no more than €100,000. However, the Belgian market remains small and most offers are even today below €100,000.

### 2.2.6 Germany

Unlike other European countries, Germany recently passed a specific legislation and for a long time followed a *laissez-faire* approach towards equity crowdfunding, which had taken place within the scope of the existing securities law. As a general rule, the German Securities Prospectus Act (WpPG, *Wertpapierprospektgesetz*) and the Investment Act (VermAnlG, *Vermögensanlagengesetz*) set the critical threshold for security and investment issues without a prospectus equal to €100,000 (Section 3 Abs. 2 Satz 1 Nr. 5 WpPG). However, the definition of what constitutes an *investment* under the Investment Act was not all-encompassing and left out subordinated profit-participating loans. This omission left scope for the issuers either to comply with the existing exemptions and raise up to €100,000 or to bypass the relevant laws altogether by structuring the investment contract in a way that allowed for offers of unlimited amounts.

On 23 April 2015, the German Parliament passed the Small Investor Protection Act (*Kleinanlegerschutzgesetz*) to regulate equity crowdfunding more specifically. According to the new regulation, firms can offer up to €2,500,000 without the obligation to register a prospectus. Similar to the US JOBS Act, the amount sold to a single investor shall generally not exceed €1000. Investors might invest

up to €10,000 per campaign if their wealth exceeds €100,000. If the investor does not have that amount of assets, the limit is twice the investor's monthly net income, but in any case not more than €10,000. Most importantly, this new rule again holds only for specific forms of investments (subordinated profit-participating loans), which did previously not fall under the definition of an investment. For other types of investments, which are commonly used in crowdfunding campaigns as well (silent partnerships and non-securitized participation rights), firms will only be able to offer €100,000 without the obligation to register a prospectus (Klöhn et al. 2016).

### 3 Model description

In this section, we develop a theoretical framework that allows us to examine the impact of exemptions to prospectus regulation on the fundraising decisions of small firms, who can decide between active, professional investors (such as venture capital funds or business angels), and the crowd (general public). The model offers a setting that considers the issuance of non-listed securities without a registered prospectus. It focuses on the main exemption from the prospectus regulation, namely, the total amount of the offer. The proposed analysis will help understand how the emergence of equity crowdfunding as an alternative source of equity finance to professional investors affects the firm's choice of financing source and ultimately optimal regulation. This in turn may offer guidance in the question whether regulation should promote equity crowdfunding.

To this end, we rely on a theoretical framework that is based on managerial rent diversion (Shleifer and Wolfenzon 2002). Managers divert rents away when not properly monitored. While professional investors are assumed able to cope with such managerial inefficiency, the crowd is assumed not able to adequately monitor the management. Further, we introduce the fact that the two types of investors offer adding value, either through active participation in the firm by professional investors (Gompers and Lerner 2000) or wisdom of the crowd in which crowdinvestors offer their ideas and feedback to the entrepreneur (Hornuf and Schwienbacher 2016).<sup>3</sup> In order

to be agnostic about the absolute size of these two forms of additional value, we focus on the difference between the two. To abstract from discounting future values and without loss of generality, let us assume all the parties are risk-neutral and the risk-free rate equals zero. This simplifying assumption implied a discount rate of zero.

#### 3.1 Issuing firms

We consider an economy populated by a continuum of firms uniformly distributed along the capital needs dimension  $\tilde{\theta} \sim [0; \Theta]$ , which specifies the level of their individual investment opportunities. Firms have a return on investment (ROI) of  $v_i > 0$  (identical for all firms), with  $i \in \{C, P\}$ , up to the level  $\tilde{\theta}$  and 0 beyond. Thus, the amount  $\tilde{\theta}$  represents external capital needs as well as desired investment size. Subscript C corresponds to equity crowdfunding, while P to professional investors. We consider that the type of financing affects the ROI, since each type of investor may add value.

Under this setting, a firm raising and investing an amount  $\theta \leq \tilde{\theta}$  will generate a value of  $(1 + v_i)\theta$ , resulting in a net present value (NPV) of  $v_i\theta$ . If not adequately monitored, entrepreneurs can divert a fraction  $\delta > 0$  of the NPV so that shareholders eventually receive only a value of  $(1-\delta)v_i\theta$ . Entrepreneurs privately receive  $(1-x)\delta v_i\theta$  from this diversion, where  $0 \leq x \leq 1$ ; the remaining fraction  $x$  (i.e., the value  $x\delta v_i\theta$ ) is lost so that it generates an inefficiency for all shareholders. Entrepreneurs are impacted in two ways: as shareholders, entrepreneurs lose value due to diversion in a similar way as any other shareholder; as managers, they gain as they divert some value privately. Depending on the relative size of the two opposing effects, entrepreneurs may overall gain or lose. To restrict the analysis to the case in which diversion is optimal in the absence of adequate monitoring, we impose the following condition under equity crowdfunding (the derivation is provided in the next section):

$$\text{Diversion Condition : } x < 1/[(1 + v_c)(1-f)]$$

The diversion condition ensures that, in equilibrium, entrepreneurs will divert corporate resources whenever

<sup>3</sup> The crowd may at times also enjoy other, non-financial benefits from participating as shareholder in the development of startups (Belleflamme et al. 2014). We abstract from these extra benefits here, as these are more likely to be important in other forms of crowdfunding.



they are not constrained by shareholders or regulation. If the condition is not met, then the entrepreneur will not divert any resources even in the absence of monitoring since he would lose more in profits as shareholder than what he gets from diverting privately.

### 3.2 Funding choices: professional investors versus equity crowdfunding

We assume that firms have no internal funds available and thus need to raise the entire capital externally. For simplicity, we assume that the entrepreneur initially owns 100% of the firm. When raising capital, entrepreneurs give up a fraction  $(1-\alpha)$  of the equity, with  $0 \leq \alpha \leq 1$ . The value of  $\alpha$  is determined so that the crowd or professional investors are willing to invest under a take-it-or-leave-it offer, while facing an opportunity cost of 0.

Professional investors can enforce internally effective governance rules. They traditionally do enforce contracts, because they hold larger equity stakes and participate on the board of directors. Moreover, they generally draft tailored contracts that enable effective intervention in case founders do not behave due diligently. However, intervention by professional investors is time-consuming and thus costly. For costs, we define them by the variable  $M > 0$ . We regard costs  $M$  as monitoring and management costs<sup>4</sup> that investors incur.

To derive practice-relevant implications, we introduce the fact that the availability of finance from professional investors varies across countries. While venture capitalists and business angels are well-developed and able to inject very large amounts in startups in some countries like the USA, these amounts tend to be smaller in other countries especially in continental Europe. Thus, let us consider the maximum amount professional investors can provide to be denoted by  $S$ . The parameter  $S$  proxies for the development of the venture capital and business angel market in a country. This assumption can be motivated by the fact that the size of venture capital funds varies across countries due to a smaller supply of capital

to the venture capital markets, combined with the standard restrictions that venture capital funds typically cannot invest more than a certain amount or percentage of total funds in a single portfolio company (Metrick 2007).

The second source of funding considered here is equity crowdfunding. Crowdinvestors may want to impose similar corporate governance and disclosure rules that mitigate agency costs. However, even if such governance rules were included in a contract, crowdinvestors could not enforce them because of coordination problems that result from free riding. The crowd is dispersed and rather passive. We consider this to be a reasonable assumption for the market, given the type of individuals participating in equity crowdfunding campaigns. In addition, the crowd does not sit on the board of directors of the firms.

Portals incur costs from managing the website and preparing the firm for the campaign, including drafting investment contract and some of the basic due diligence. In practice, these costs are passed on to the firms. We consider a percentage fee, since the bulk of the portals use such a fee structure. Let us define the fee by  $f > 0$ , which is charged to the firm after a successful campaign.

### 3.3 The regulator

The regulator imposes registration and *ex ante* disclosure requirements for any security offer to the general public above a given threshold amount  $T \geq 0$ , which can be larger or smaller than  $S$ . This view is consistent with real-world exemptions, as we have shown in Section 2. A higher threshold value of  $T$  implies a lower investor protection in general, because fewer firms comply with securities regulation.

Complying with these requirements leads to fixed costs of  $C > 0$  for the firms, which may differ from monitoring costs  $M$  incurred by professional investors. These compliance costs may arise for different reasons; some may be incurred by filing with the regulator, while others may be due to the disclosure of relevant information to investors. We assume firms complying with disclosure regulation can no longer divert value for private purposes. Consistent with practice, we assume that firms can only seek compliance with the regulator if their capital needs are larger than  $T$ . In what follows, we

<sup>4</sup> Under  $M$ , we consider any costs other than “effort costs” that would lead to moral hazard. Thus, we assume costs  $M$  as those costs that are borne by investors by the sake of being “sophisticated”. These costs include legal costs as well as costs incurred from running a management firm.

assume that costs  $C$  are too high for the firms considered in our baseline model.

We consider a benevolent regulator who maximizes total welfare in the economy that is the sum of value created by the firms seeking external finance. Thus, the regulator balances the social costs and benefits generated by setting the variable  $T$ .

### 3.4 Time line

We consider the following time line. At time  $t = 0$ , the regulator sets  $T$ , which becomes public knowledge. At  $t = 1$ , the firm decides whether to raise funds from a professional investor or through equity crowdfunding. At  $t = 2$ , entrepreneurs make investment decisions, by deciding how much to raise and thus offer a fraction  $(1-\alpha)$  of ownership. Finally, at  $t = 3$  firms realize their payoffs, which are then distributed. Consistent with rational behavior, we solve the game by backward induction and maximize firm value based on the entrepreneur's perspective.

## 4 Optimal choice of funding and securities regulation

### 4.1 Optimal outcome for the entrepreneur

In this section, we derive the optimal choice of funding. We first consider the outcome under equity crowdfunding and professional investors separately and then compare them.

Case [1]: under equity crowdfunding, an entrepreneur with given capital needs  $\tilde{\theta} \leq T$  receives  $\alpha[(1 + v_c)\tilde{\theta}(1-f) - \delta v_c\tilde{\theta}(1-f)] + (1-x)\delta v_c\tilde{\theta}(1-f)$ , subject to the crowd at least breaking even in their investment:  $(1-\alpha)[(1 + v_c)\tilde{\theta}(1-f) - \delta v_c\tilde{\theta}(1-f)] = \tilde{\theta}$ . The first term in the first equation represents the financial gains to the entrepreneur of also being a shareholder (net of diversion costs  $\delta v_c\tilde{\theta}(1-f)$ ), the second one  $(1-x)\delta v_c\tilde{\theta}(1-f)$  her private benefits from diversion.<sup>5</sup> This leads to the

<sup>5</sup> These simple formulas allow to formally derive the Diversion Condition, where we need to solve the following condition  $\alpha[(1 + v_c)\tilde{\theta}(1-f) - \delta v_c\tilde{\theta}(1-f)] + (1-x)\delta v_c\tilde{\theta}(1-f) > \alpha[(1 + v_c)\tilde{\theta}(1-f)]$ , subject to  $(1-\alpha)(1 + v_c)\tilde{\theta}(1-f) = \tilde{\theta}$ . The left-hand side of the inequality is the entrepreneur's profits under equity crowdfunding when diverting value from shareholders (as stated above); the right-hand side is her profits when not diverting; finally, the second equation gives the equilibrium financing condition for the crowd under the assumption that the entrepreneur does not divert any profits. Substituting  $\alpha$  from the second equation into the inequality leads to the Diversion Condition as stated above.

following gains for the entrepreneur:  $(1-x\delta)v_c\tilde{\theta}(1-f)$ . Any firm with  $\tilde{\theta} > T$  will not raise more than  $T$ , as otherwise the firm would need to obtain a costly prospectus approval; thus, gains are capped at  $(1-x\delta)v_cT(1-f)$ . The portal receives the total fees of  $f\tilde{\theta}$  from the firm raising  $\tilde{\theta}$ .

Case [2]: under professional investor finance, the entrepreneur will raise a capital amount of  $\tilde{\theta} \leq S$  and receives  $\alpha(1 + v_p)\tilde{\theta}$ , subject to investor at least breaking even in the investment:  $(1-\alpha)(1 + v_p)\tilde{\theta} = [\tilde{\theta} + M]$ . Here, only financial returns accrue to the entrepreneur, since no diversion takes place. Thus, the entrepreneur receives  $v_p\tilde{\theta} - M$ . Any firm with  $\tilde{\theta} > S$  will have its gains capped at  $v_pT - M$ .

Both outcomes under [1] and [2] are depicted in Fig. 1 whenever  $S > T$ . It is straightforward to derive the threshold level of  $T$ , called  $\underline{T}$  that makes equity crowdfunding as efficient as professional investors:

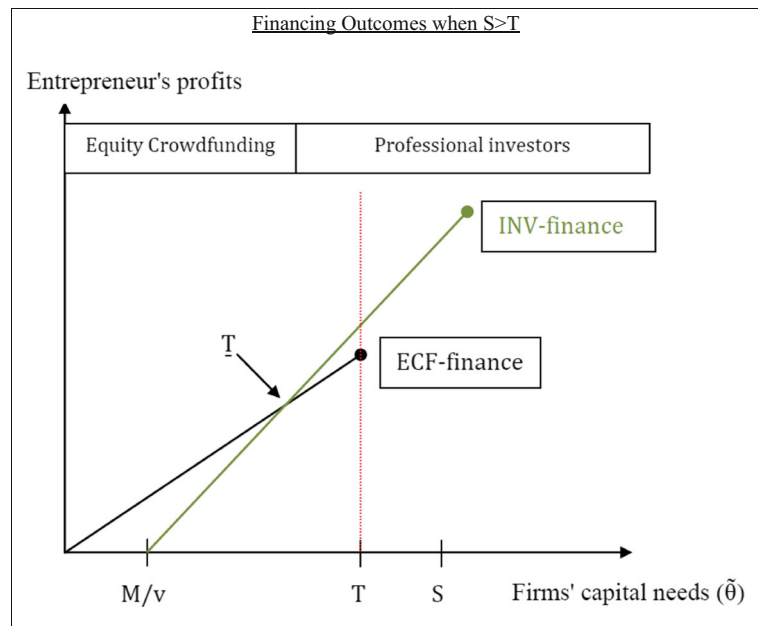
$\underline{T}$  such that  $(1-x\delta)v_c\underline{T}(1-f) = v_p\underline{T} - M$  or :

$$\underline{T} = M / \left[ v_p - (1-x\delta)v_c(1-f) \right]$$

Therefore, equity crowdfunding is the optimal choice of entrepreneurs seeking capital lower than  $\underline{T}$ , and otherwise opting for professional investors is optimal. Above the amount  $S$ , professional investor can no longer supply the full amount, so that the firm needs to seek prospectus approval from the regulator. Note that fees charged by portals also affect the threshold, since fees reduce the amount left for investments and thus the overall profitability of the firm. Higher portal fees reduce profits under equity crowdfunding, making it less attractive relative to professional investors. The result is a lower  $\underline{T}$ . Moreover, differences in adding value between the crowd ( $v_c$ ) and professional investors ( $v_p$ ) shift the threshold  $\underline{T}$ . An increase in  $v_c$  relative to  $v_p$  increases  $\underline{T}$ , which is consistent with equity crowdfunding becoming more profitable and thus more attractive relative to professional investors.

When  $S < T$  (the venture capital and angel market is poorly developed), a discontinuity occurs. The size of the discontinuity depends on the magnitude of the difference between  $S$  and  $T$ , as depicted in Fig. 2. Also, there is an area (gray shaded in Fig. 2) that represents firms with capital needs ( $\tilde{\theta}$ ) that are larger than the threshold  $T$ . These firms can only raise the amount  $T$ , since raising more would lead to less profit due to the lack of larger amounts from professional investors and

**Fig. 1** Financing outcomes when  $S > T$ . INV-finance denotes the outcome under financing with professional investors, ECF-finance with equity crowdfunding. The  $x$ -axis represents the amount to be issued, while the  $y$ -axis the entrepreneur's profit level. The point  $T$  corresponds to the situation where the entrepreneur is indifferent between the two financing alternatives



excessive inefficiencies under equity crowdfunding. These firms consequently forego some of their investment opportunities, because there is no source of capital available to (efficiently) fund them.

It is optimal for the entrepreneur to seek equity crowdfunding below  $T$  for the same reason as above, but potentially also for larger amounts if the small offer exemption level  $T$  is large enough to make it worthwhile. In the case depicted in Fig. 2, this is not happening, but would happen if  $T$  would be as large as  $\bar{T}$ . Then, larger equity crowdfunding campaigns would occur.  $\bar{T}$  can formally be derived as the solution to the following condition (assuming investors under prospectus approval add as much value as professional investors considered so far; i.e.,  $v_p$ ):

$$(1-x\delta)v_c\bar{T}(1-f) = v_p\bar{T}-C \text{ or : } \\ \bar{T} = C / [v_p - (1-x\delta)v_c(1-f)]$$

#### 4.2 Market equilibrium under endogenous regulation

Figures 1 and 2 are helpful in deriving the optimal level of exemption, denoted below as  $T^*$ , from the perspective of the securities regulator. This level is affected by the degree

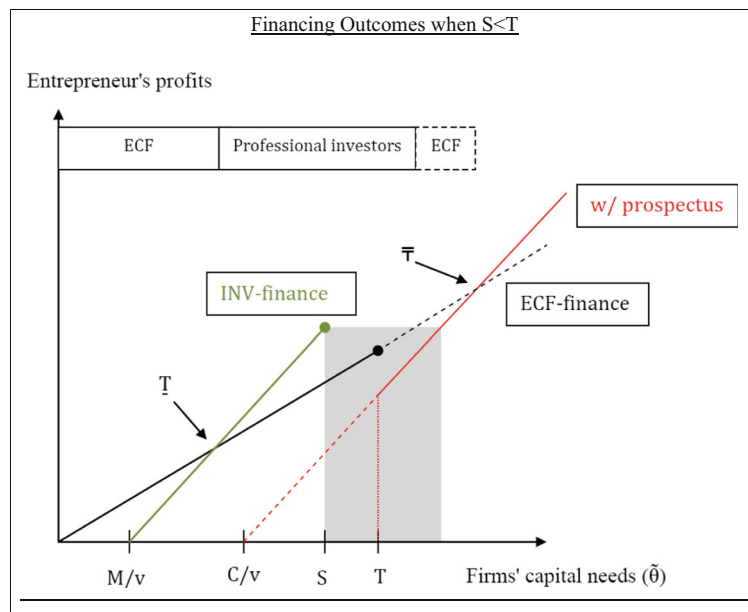
of development and efficiency of the venture capital and business angel market. However, a note is warranted here. Our optimal outcome abstracts from effects that such exemptions may have on the other firms seeking equity finance. Therefore, we will consider below the lowest possible exemption value as being the optimum, as it also minimizes any impact on other firms in the economy.

Formally, the optimal level of exemption for equity crowdfunding is as follows:

$$T^* = \underline{T} \text{ if } T < S \quad T^* = \bar{T} \text{ if } T > S$$

This result yields the following empirical implications. First, a more developed venture capital and business angels market enables a lower threshold  $\underline{T}$ , since it has a higher  $S$  (professional investors can finance firms with larger capital needs as their funds are larger) and lower  $M$  (professional investors are able to do more cost-efficient contracting and monitoring).<sup>6</sup> Thus, it does not require the regulator to set a higher level of exemption. For sufficiently large venture capital and

<sup>6</sup> Empirically, costs  $M$  may be proxied by the number of law firms and the quality of legal institutions, as this affects legal costs of drafting contracts and advising services for venture capital funds.



**Fig. 2** Financing outcomes when  $S < T$ . INV-finance denotes the outcome under financing with professional investors, ECF-finance with equity crowdfunding. The *red line* shows the outcome with a formal prospectus for either traditional capital markets or equity crowdfunding campaigns above the small offerings exemption  $T$ , for which amounts of issuances must be larger than the threshold  $T$ . The *x-axis* represents the amount to be issued, while the *y-axis* the entrepreneur's profit level. The point  $T$  corresponds to the situation

where the entrepreneur is indifferent between equity crowdfunding and financing with a formal prospectus (if the threshold where large enough to allow equity crowdfunding campaigns to be larger than  $T$ , which is not the case in this figure; therefore, this range of outcomes is indicated in a *dotted box* at the top of the figure as "ECF"). The *dotted part of the black and red lines* represents possible outcomes if the regulator changes  $T$

business angel markets, the exemption level can even be substantially reduced.

Moreover, when  $S > T$  (the more general case), the condition derived above indicates that  $T$  is decreasing in the following, exogenous parameters: extent of managerial rent diversion (the parameter  $\delta$ ), the degree of losses derived from such diversion (the parameter  $\alpha$ ), and portal fees (the parameter  $f$ ). For the ROI, the direction of impact depends on whether we consider  $v_c$  or  $v_p$ , as discussed above. A greater rent extraction possibility creates a higher cost of capital under equity crowdfunding, since crowdinvestors will require a higher rate of return for purchasing securities from the firm. Similarly, greater losses from diversion and higher portal fees make again equity crowdfunding less valuable relative to professional investors, which reduces the optimal level of exemption.

For the opposite case where  $S < T$  (see Fig. 2), the regulator has an incentive to increase  $T$  to compensate for shortage of professional investors. The optimal level

is  $\bar{T}$ . This scenario corresponds to cases in which venture capital and business angel markets are underdeveloped. Overall, we expect regulators in countries with smaller venture capital and business angel markets to have incentives to set less restrictive exemptions.

#### 4.3 Empirical implications

The parameter  $T$  can be directly interpreted as the level of investor protection, in which a *lower* value of  $T$  represents *more* investor protection *on average*. The conclusions of our theoretical model lead to the following empirical predictions. First, more investor protection leads to fewer equity crowdfunding campaigns, since the bulk (if not all) of these campaigns take place under securities regulation exemptions. This may eventually create a smaller equity crowdfunding market, because many firms will find it economically not worthwhile to seek prospectus approval by the national regulator. Others may seek financing from professional investors. In the absence of any exemptions, smaller firms may

even refrain from entering the market in the first place, since equity crowdfunding may be their only option in terms of equity finance. The complete absence of an exemption ( $T = 0$ ) leads to an exclusion of firms with the lowest capital needs, which would not be started in the first place. This is especially true if there is not a sufficiently large, professional market available as main alternative source of seed capital.

Our main conclusion from this analysis is that regulation maximizing investor protection hurts small firms and those relying on equity crowdfunding are likely to be smaller firms seeking seed or early-stage capital. This is because these firms are too small to obtain funding from professional investors and thus may lack alternative sources of equity capital. Optimal securities regulation therefore has to trade off the costs of ensuring sufficient investor protection with the benefit of easier access to capital for startup firms, which can be an important driver for economic growth.

The extent to which exemptions to the prospectus regulation are needed depends on the availability of alternative sources of capital, mostly from professional investors. Countries with well-developed markets of professional and private investors may have fewer exemptions. Interestingly, the USA has a well-developed professional investor market, which can compensate for the lack of exemptions needed to tap the crowd. This contrasts with Europe, where the angel and venture capital markets are smaller.

We further expect a substitution to occur away from professional investors, not for firms with lower capital needs but with average levels. With equity crowdfunding, these firms now have an alternative source of funding. For some firms, the latter may economically be more interesting, so that they seek funding from the crowd instead of professional investors. In fact, changing the level of small offer exemption  $T$  may have no impact on equity crowdfunding activities in business sectors that are well-covered by professional investors, except for very small issuances. However, other areas may be affected more when poorly covered by professional investors. This may be more likely in areas with limited growth prospects.

## 5 Are existing exemptions too restrictive: some empirical evidence

In this section, we illustrate the impact of exemptions as defined in national securities regulation on equity

crowdfunding campaigns. To achieve this goal, we offer evidence that restrictive exemptions may create a funding gap, where firms raise inefficiently low amounts of capital.

As our theoretical model predicts, firms may restrict their fundraising goal if the small offer exemption threshold is low. One good example is Germany, which after the UK possesses one of the most developed equity crowdfunding market in Europe (Hornuf and Schmitt 2016) but for a long time set the critical threshold for the small offerings exemption at the lower bound of €100,000. We illustrate that this regulation created a funding gap by relying on the cases of Seedmatch and Companisto. Moreover, like many other continental European countries, the German venture capital and business angel markets are much less-developed than in countries such as the USA and the UK.

The contracts that Seedmatch provided to issuers were initially designed to comply with the German Investment Act. All the initial 26 equity crowdfundings offered by Seedmatch used the existing exemption, and a total of 24 issues had to be terminated at the threshold of the exemption at €100,000, which indicates that issuers had higher capital needs. Moreover, as campaigns were sometimes funded very quickly,<sup>7</sup> firms' capital needs could have easily been satisfied by the crowd and were only constrained by the existing threshold under the Investment Act (see Fig. 3).

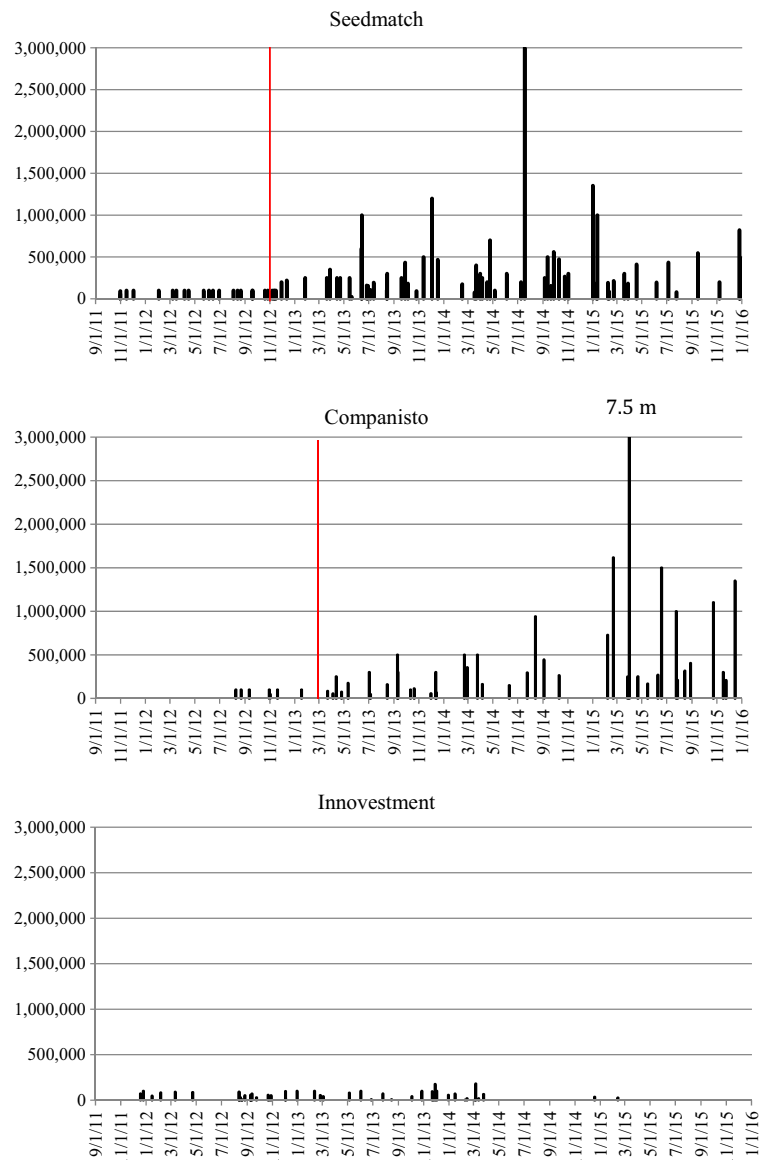
Seedmatch and other portals soon realized the legally imposed funding constraint and tried to circumvent the existing securities legislation. On November 29, 2012, Seedmatch offered for the first time subordinated profit-participating loans, which until July 10, 2015 were not classified as investment under the German Investment Act and thus did not require the registration of a prospectus. While there was some legal uncertainty surrounding this issue, subordinated profit-participating loans allowed issuers to raise unlimited amounts without the obligation to draft and register a prospectus.

The equity crowdfunding campaigns on Companisto show a similar trend after the portal switched contracts

<sup>7</sup> On November 29, 2012, it took Protonet only 48 min to raise €200,000 on Seedmatch. In May 2014, the same firm raised another €1,500,000 in 10 h and 8 min, after which the founders decided to continue raising funds. Eventually, they raised €3,000,000 in a few days only.



**Fig. 3** Amounts raised in equity crowdfunding campaigns on Seedmatch ( $N = 84$ ), Companisto ( $N = 47$ ), and Innvestment ( $N = 47$ ) in the period from August 1, 2011 to January 1, 2016. The red lines separate the period before and after subordinated profit-participating loans were used to circumvent the threshold of the small offering exemption as defined in the German securities law ( $T = €100,000$ ). Before financial contracts circumvented the threshold, the average amounts raised were €98,048 for Seedmatch campaigns and €91,673 for Companisto campaigns; thereafter, the amounts rose to €391,440 and €596,827, respectively (including amounts pledged in unsuccessful campaigns). Innvestment never changed its investment contract to circumvent the threshold of the German securities law and exhibits an average funding amount of €60,085 per campaign (including amounts pledged in unsuccessful campaigns).



to subordinated profit-participating loans on February 4, 2013. After the implementation of the new investment contract, the funding volumes per campaign more than sextupled on Companisto, while on Seedmatch they almost quadrupled. The largest issue funded under this contractual design raised a total of €7,500,000 for a real estate project. A comparison with Innvestment, which might serve as a control group because the portal has not adopted subordinated profit-participating loans, evidences that the increase in funding volumes does not merely reflect a general trend in the selection of funding campaigns. The

average funding size at Innvestment was €60,085, somewhat below the threshold of €100,000, and increased only slightly to €64,796 in the period when Seedmatch adopted subordinated profit-participating loans.

## 6 Discussion and concluding remarks

This study discusses recent reforms in different countries and presents some empirical evidence based on the German experience in permitting non-accredited investors

access to equity crowdfunding. While our analysis remains exploratory, it contributes to the ongoing policy debate on how to regulate the market and to examine its potential impact on business finance. This debate is motivated by the fear expressed by some regulators and academics that entrepreneurs may take advantage of the less sophisticated crowd, by strategically avoiding to raise capital from sophisticated investors (Hazen 2012; Griffin 2013).

Our simple theoretical framework generates key policy implications in relation with alternative sources of entrepreneurial finance. A central implication is that benefits related to weaker investor protection that promote equity crowdfunding markets are higher when the availability of venture capital and angel capital is scarce. The notion that strong investor protection can be harmful is counter-intuitive to the traditional law and finance literature that focuses on large firms. A tailored regulation may therefore be needed for equity crowdfunding, as securities regulation primarily deals with regulating large issuances and therefore impose significant compliance costs that are prohibitively high for small firms. Moreover, a lack of specific regulation for equity crowdfunding may induce portals to resemble online angel networks and thus offer little differentiation with existing sources of entrepreneurial finance.

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## References

- Acs, Z. J., Audretsch, D. B., Lehmann, E. E., & Licht, G. (2016). National systems of entrepreneurship. *Small Business Economics*, 46(4), 527–535.
- Ahlers, G. K. C., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, 39(4), 955–980.
- Bagley, C.E. and Dauchy, C.E. (2003) The entrepreneur’s guide to business law, 3rd Edition, Thomson West.
- Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: tapping the right crowd. *Journal of Business Venturing*, 29(5), 585–609.
- Gompers, P., & Lerner, J. (2000). Money chasing deals? The impact of fund inflows on private equity valuation. *Journal of Financial Economics*, 55, 281–325.
- Griffin, Z. J. (2013). Crowdfunding: fleecing the American masses. *Case Western Reserve Journal of Law, Technology & the Internet*, 4(2), 375–410.
- Hazen, T. L. (2012). Crowdfunding or fraudfunding? Social networks and the securities laws—why the specially tailored exemption must be conditioned on meaningful disclosure. *North Carolina Law Review*, 90, 1735–1770.
- Hornuf, L., & Schmitt, M. (2016). Success and failure in equity crowdfunding. *CESifo DICE Report*, 14(2), 16–22.
- Hornuf, L. and Schwienbacher, A. (2016) Crowdinvesting—angel investing for the masses? in: Handbook of Research on Venture Capital: Volume 3. Business Angels: Edward Elgar (Ed. C. Mason and H. Landström), 381–397.
- Klöhn, L., Hornuf, L., & Schilling, T. (2016). The regulation of crowdfunding in the German small investor protection act: content, consequences, critique, suggestions. *European Company Law*, 13(2), 56–66.
- Knight, T. B., Leo, H., & Ohmer, A. (2012). A very quiet revolution: a primer on securities crowdfunding and title III of the JOBS act. *Michigan Journal of Private Equity & Venture Capital Law*, 2, 135–153.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2006). What works in securities Laws? *Journal of Finance*, 61, 1–32.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *Journal of Finance*, 52, 1131–1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106, 1113–1155.
- Metrick, A. (2007). *Venture Capital and the Finance of Innovation*. Wiley & Sons.
- Schwienbacher, A. (2016). Crowdfunding and the ‘Alternativfinanzierungsgesetz’ in Austria. *CESifo DICE Report*, 14(2), 33–36.
- Shleifer, A., & Wolfenzon, D. (2002). Investor protection and equity markets. *Journal of Financial Economics*, 62, 3–27.
- Vismara, S. (2016a). Equity retention and social network theory in equity crowdfunding. *Small Business Economics*, 46(4), 579–590.
- Vismara, S. (2016b). *Information cascades among investors in equity crowdfunding*. Forthcoming: Entrepreneurship Theory and Practice.